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Alina Simona Rusu

Human Ethology

PRIMER FOR STUDENTS



Facultatea de Zootehnie și Biotehnologii
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Presa Universitară Clujeană

Alina Simona Rusu

Human Ethology

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PRESA UNIVERSITARĂ CLUJEANĂ

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INTRODUCTION

This manual represents a primer for guiding the first year students that enrolled in the master's degree „*Ethology & Human-Animal Interaction*" (EHAI), Faculty of Animal Sciences and Biotechnology, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca (USAMVCN) in the process of understanding evidence-based scientific research methods and concepts in the field of human ethology. It is important to mention that the manual serves as an internal resource only for the EHAI students that have included the subject „Human Ethology" in their study plan. The primer is organized in **seven lessons**, each one corresponding to a session of two hours meeting with the students.

This primer is based on several chapters and articles with open access in the field of Human Ethology (some of them written or co-authored by the author of the primer, Alina S. Rusu), which will be indicated as resources for studying at the beginning of each lesson and throughout the text of the manual. The primer is designed to facilitate the development of students' skills to access scientific resources in terms of models and variables used in the literature and knowledge of ethical principles in research, including the development of scientific papers in Human Ethology, as well as skills to present in an applicative and critical manner topics associated with the subject.

The specific objectives of this primer are to provide theoretical and procedural knowledge to the EHAI students, with the aim of empowering them with abilities to observe and interpret human behavior in different spatial-temporal and cultural settings (individual, institutions: family, couple, society etc.), including not only intraspecific interactions, but also interspecific ones, i.e. human-animal interactions. The EHAI students enrolled in the Human Ethology class are expected to become familiarized with the history and the key concepts of human ethology, as well as with the methods used in collecting human behavioral data. The primer provides an interdisciplinary base for critical thinking, reflection and interpretation of aspects of human behavior in different ontogenetic moments, cultural contexts and interactions with various components of the environment.

The material included in the primer supports a series of Human Ethology lectures on various topics, such as: history of human ethology and sources for research ideas, overview of the ethological methods for collecting behavioral data in humans, interdisciplinary insights into the ontogeny of human behavior, the renovated pyramid of human needs – the case of human products as indicators of human behavior, emotion expression and recognition – an overview of the FACS system, non-verbal communication in humans – the case of mating strategies and of the communication paradox in the context of seductive behavior, and the social behavior in humans – an ethological and evolutionary approach of helping behavior.

All these lectures have corresponding seminars, in which the students will be familiarized with the ethological methods of data collection in several life contexts, such as the OR context, waiting room situation, playing contexts, learning/ TEACH method, laughing and smiling etc. The seminars will include presentations of papers and of TED x Talks on topics related to the lectures.

LESSON 1.
HISTORY OF HUMAN ETHOLOGY – ON THE IMPORTANCE OF INTERDISCIPLINARY APPROACHES IN STUDYING HUMAN BEHAVIOR

This lesson will present information of the historical context of the emergence of human ethology and on several key concepts and paradigms behind these concepts, aiming to facilitate the understanding of the approaches of studying human behavior in various contexts and levels (individual, group, population and species).

> ***Note:*** *for this lesson, the students are recommended to read the chapters 2 and 3 in Laland, K.N., & Brown, G.R. (2002). Sense and Nonsense: Evolutionary Perspectives on Human Behavior. Oxford University Press. The book is provided in pdf format in the Intranet folder, but it can be also found as a resource on the Google scholar platform.*

Ethology is commonly defined as the scientific study of animal behavior in natural conditions. Within the field of ethology, the domain of **human ethology (HE)** is generally associated with the name of **Irenaus Eibl-Eibesfeldt** (1928-2018), an Austrian zoologist, who supported through his studies the ethological methods that can be applied to document human behavior. For example, Eibl-Eibesfeldt

used ethological quantitative methods to measure behavior in preliterate human societies, as evolutionary anthropologists and behavioral ecologists. Irenaus Eibl-Eibesfeldt was one of the students of the famous scientist **Konrad Lorenz** (1903-1989), one of the pioneers of the domain ethology ("ethos" means character in Greek).

Based on knowledge of the natural history of animals, the early ethologists, i.e. at the beginning of the XX century, set out to examine those clear behavior patterns that are seen in all individuals of one species, they are triggered by specific category of stimuli (*key or sign stimuli*) and they do not request learning throughout the development. These studies supported the idea of instinctive behaviors, which are also known as **fixed action patterns (FAPs)** or fixed motor patterns (e.g. the begging behavior of bird chickens when their parents bring food to the nest, the mating dance of paradise birds etc.). Some specific movements in the courtship behavior in birds allow differentiation between species in similar manner to other physical traits. Hence, we can infer that the methods used in comparative morphology could be applied to the study of behavior of animals. Instincts were often explained as being inherited and adapted system of coordination within the nervous system, which allowed the researchers to focus on **the survival value** of the FAPs.

A famous example of FAP is the **baby schema** (Kindchenschema, Lorenz, 1950), which represents a set of facial features (i.e., large head and a round face, a high and protruding forehead, large eyes, and a small nose and mouth) commonly found both in human and animal infants. In classical ethology, this specific configuration of features are described as triggering stimuli of an

innate releasing mechanism for caregiving and affective orientation toward infants (Lorenz, 1950). More recently, its role in promoting human nurturing behavior was demonstrated at the neurophysiologic level using neuroimaging (E.g. Borgi et al., 2014).

Exercise:

Students are recommended to explore the literature in order to find recent papers exploring the baby-face schema in humans and animals by using advanced techniques, such as fMRI or eye-tracking methods. One example of such studies is the one published by Borgi et al. (2014), entitled *Baby schema in human and animal faces induces cuteness perception and gaze allocation in children* (Fig. 1).

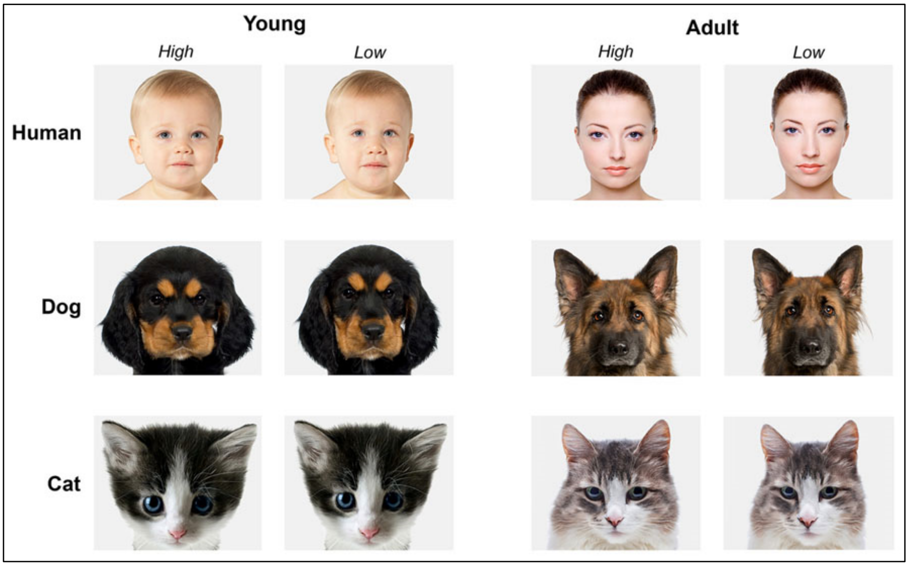


Fig. 1. A figure illustrating the analysis of baby-schema in humans and other animals, extracted from the publication of Borgi et al. (2014).
Source: https://www.frontiersin.org/articles/10.3389/fpsyg.2014.00411/full

In 1936, Konrad Lorenz met **Nikolaas Tinbergen**, a zoologist at University of Leiden, in Holland (he moved to England around 1950), who developed a research programme characterized by observational and experimental study of animals in their natural environments (for more details on this biographic aspect, students are recommended to check the chapters II and III in Laland & Brown, 2002). Early 1950 – ethology has emerged as a new discipline. The studies of Lorenz and Tinbergen were later on joined by those of the Austrian ethologist, **Karl von Frisch**, on the communication system of the honeybees. In 1973 – Lorenz, Tinbergen and Von Frisch – were awarded the Nobel Prize for Medicine "for their discoveries concerning the organization and elicitation of individual and social behavior patterns" → optimistic vibe regarding the importance of ethological methods in understanding human behavior (Fig. 2).

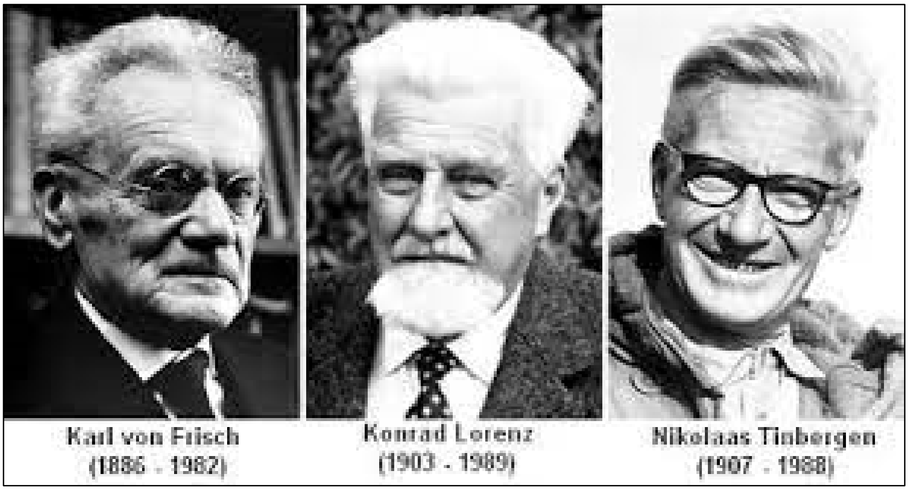


Fig. 2. The three Nobel Prize winners in 1973 for their discoveries in the scientific study of animal behavior.
Source: https://sandwalk.blogspot.com/2008/08/nobel-laureates-karl-von-frisch-konrad.html

The major contribution to the field of ethology of the three pioneers consists, among others, on the development of behavioral data collection through direct observation: the **ethological method.** The ethological method typically begins with an extensive period of observation of the animal in its native environment, followed by a careful description of behavioral patterns, which were later on named **behavioral units**.

Based on the recorded behavioral units in different circumstances of individuals of various species, the next step of the ethological method is the creation of an **ethogram**, i.e. an inventory of carefully defined behavior units and patterns that can be recognized and reliably documented. The ethograms are typically designed around research questions and variables that researchers deem relevant to address these questions. It is very important for the students to understand that the behavior units of interest are defined in an explicit manner to ensure the method of data collection is replicable.

In 1963, Nikolaas Tinbergen formulates **four questions** of approaching animal and human behavior, which take into account the survival and reproductive values of the FAPs, not only their description. The four questions are usually categorized as **HOW** and **WHY** of questions, or the proximate and ultimate approaches of behavior. The four questions formulated by Tinbergen are the following (from Laland & Brown, 2002):

1. **Function (**or **adaption)**: Why is the animal performing the behavior? In which way does the behavior increase the

animal's **fitness** (i.e. the capacity of an individual for survival and reproduction)?

2. **Evolution (**or **phylogeny)**: How did the behavior evolve? How has natural selection modified the behavior over evolutionary time? This is typically addressed by the comparative approach, where the behavior in question is compared among closely related species.
3. **Causation (**or **mechanism)**: What causes the behavior to be performed? Which stimuli elicit or what physiological mechanisms cause the behavior?
4. **Development (or ontogeny):** How has the behavior developed during the lifetime of the individual? In what way has it been influenced by experience and learning.

The questions 1 and 2 are included in the category of the **ultimate questions** (Why?), while the questions 3 and 4 are included in the category of the **proximate** questions (How?).

Following the publication of Konrad Lorenz's book "On aggression" (1963), there were intensive debates among the European ethologists and the comparative psychologists from the Northern US upon the idea apparently derived from the book, that aggression and tendency to fight in wars are natural expression of human instinctive aggression.

Stimulated by this long period of debates, in 1983, a group of expert scientists had a meeting on aggression in Spain and the **Seville**

Statement on Violence was elaborated (Fig. 3, from Laland & Brown, 2002).

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Table 2.3 The 1986 Seville Statement on Violence

1. It is scientifically incorrect to say that we have inherited a tendency to make war from our animal ancestors
2. It is scientifically incorrect to say that war or any other violent behaviour is genetically programmed into our human nature
3. It is scientifically incorrect to say that in the course of evolution there has been a selection for aggressive behaviour more than for other kinds of behaviour
4. It is scientifically incorrect to say that humans have a violent brain
5. It is scientifically incorrect to say that war is caused by instinct or any single motivation

Fig. 3. The Seville Statement on Violence. Source: Laland & Brown, 2002.

In 1979, Human Ethology emerged as a sub-discipline within the field of ethology officially emerged, being supported by the already existing group of researchers (and their studies), that gathered together around Irenaus Eibl-Eibesfeldt starting from the year 1972, when the bases of the **International Society for Human Ethology** were built (www.ishe.org, Fig. 4). The students are encouraged to go through the official publication of the ISHE society, a journal named *Human Ethology*, which can be accessed here: https://ishe.org/human-ethology/.

Fig. 4. The logo of the International Society for Human Ethology.
Source: www.ishe.org.

LESSON 2.
METHODS OF COLLECTING BEHAVIORAL DATA IN HUMANS

In this lesson, the students will become familiarized with methods that are commonly used in human ethology and sources of data on human behavior, such as: behavioral observations – anecdotal or based on specific ethological methods of data collection: ad libitum sampling, all occurrence sampling, focal animal sampling, scan sampling, time budget, surveys, TV news stories, written media, social media and other human products.

> ***Note:*** *for this lesson, the students are recommended to read the article (Fig. 5), which can be found in pdf format on the Human Ethology journal's site and on the website of the author (http://maryannefisher.ca/publications-of-maryanne-fisher/): Fisher, M. L. (2017). Where to start with ethological research: A student-centered primer with examples. Human Ethology Bulletin, 32(4), 27-34.*

Human Ethology Bulletin 32 (2017)4: Special Issue - Why Behaviour Observation?: 27-34
Theoretical Review

WHERE TO START WITH ETHOLOGY RESEARCH: A STUDENT-CENTERED PRIMER WITH EXAMPLES

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Fig. 5. Print of the front page of the referred article written by Fisher (2017).

The **behavioral observation methods** that are commonly used in ethology (and in human ethology) are described bellow, following the information provided by Martin and Bateson (1993). *For details on the behavioral data collection, students can check the book:* Martin, P., & Bateson, P.P.G. (1993). *Measuring behavior: An introductory guide* (2nd ed.).

1) Ad Libitum sampling (ad lib)

- The observer records whatever they can see and that they think it is relevant at the given time (opportunistic observations).
- This method is informal, non-systematic, often used in field notes, when the students / researchers do not have specific information about an individual, group or population and there is not yet a clear research objective established.
- Risks associated with this method: since the observer can not keep track of everything that is going on, the results of these observations might be biased by the behavior, individual and/or situation that most attract the observer‘s attention.
- This method is considered useful in the early stages of a project or in the preparation process for the generation of an ethogram (behavioral repertoire of a species), in documenting specific events (e.g. analysis of videos from airports or malls, prior reported incidents) etc.

2) Focal Animal/ Individual Sampling

- This method is suitable to the cases when the observer is interested in what a particular individual is doing over a given amount of time and it can be used to record behavioral states and/or events.
- The observers focus their attention on a specific individual for a specified period of time (e.g. 2 min, 30 seconds, one hour) and records all the instances of behavior relevant to the study. For example, one can record all the behavioral units that follow one after another (i.e. chain of units or chain of behavioral sequences), or one can record one type of behavioral units. *Note: For this method, a set of behavioral units (a working ethogram) is established before the recording starts. For each unit, an acronym can be generated. Example: touching the tip of the nose – TTN, smiling = S, turning head to right = THR.*
- If the observer aims to study different individuals of the same social group, the choice of the focal individual should be made before the beginning of the observation period.
- It is recommended to video-record the session than play it frame by frame when performing the focal individual sampling,

3) All Occurrence Sampling

- The observer watches the whole group of subjects or one individual, and records each occurrence of a particular behavioral unit, describing the context in which it occurs in as much detail as is required.

- The method is used whether the observers are interested in a specific behavior, rather than the overall activity of an individual or a group. E.g. the smiling behavior in several contexts, the occurrence of yawning behavior, vocal alarm sound in group of meerkats, pacing behavior in zoo animals before and after an enriching intervention etc.
- Important aspect: the behavior unit under study should be obvious to the observer, easy to identify it.

4) Scan Sampling

- A whole group of individuals is rapidly scanned at regular intervals of and the behavior of interest manifested by each individual is recorded (this data sampling is combined with focal individual sampling and all occurrence sampling).
- The technique is best suited for behavioral states / postures, because some events/ actions are likely to be missed. E.g. the observations of manifestations of vigilance behavior in a group of humans when they hear an ambulance on the street.
- Important aspect: When the scanning interval is very short (under one second), the method is usually called continuous scan sampling. The collected data allows the observer to create a chain of behavioral units / behavioral sequences following one after another for the individual that is being observed. In case of continuous scan sampling, both the postures and the events can be easily recorded.

In all the methods of data collection presented above, the duration of each behavior unit can be recorded. Data can be collected either manually or by using automatic devices, such as Noldus (Fig. 5), or other free software created by researchers, e.g. Jwatcher (Fig. 6) or EthoLog (Fig. 7).

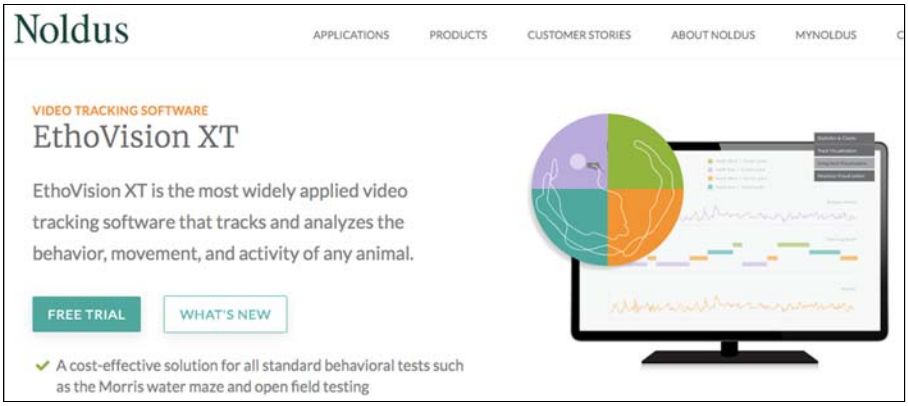


Fig. 5. Print screen of the official website of EthoVision by Noldus. Source: www.noldus.com.

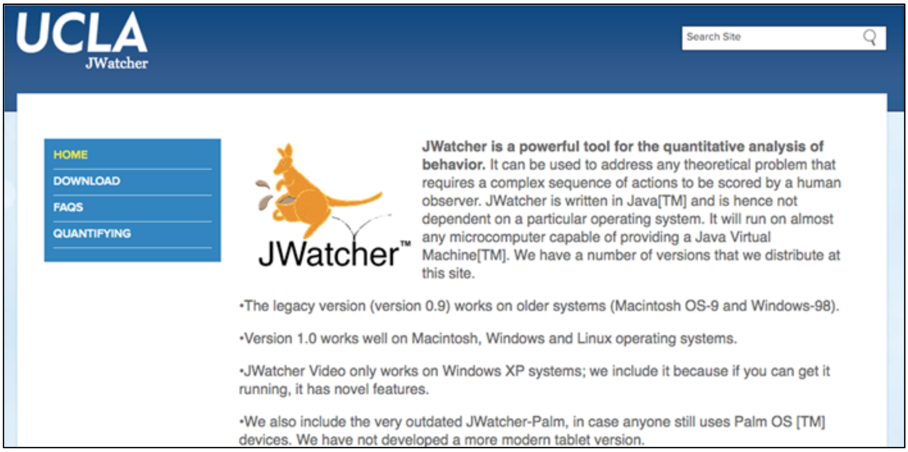


Fig. 6. Print screen of the official website of the *Jwatcher*. Source: https://www.jwatcher.ucla.edu/

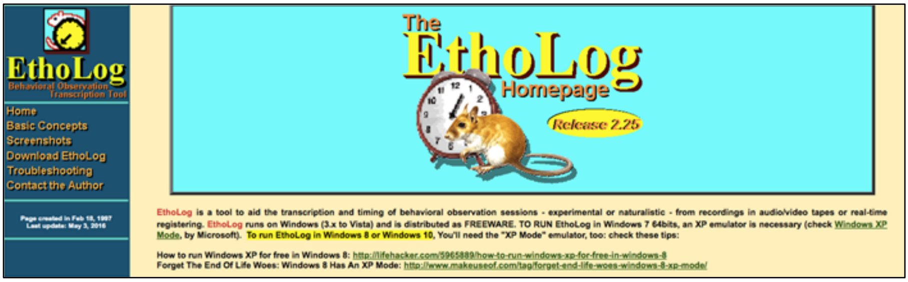


Fig. 7. Print screen of the official website of the *The EthoLog*.
Source: https://www.ip.usp.br/etholog/ethohome.html

The sampling methods described above allow the producing of **ethograms,** which represent the inventories of sequences and behavioral positions (behavioral units) of an individual or of a species, which can be presented within specific categories of behavior (e.g. foraging, mating, social behavior). Usually, the ethograms are developed by using the Ad libitum, Focal Animal Sampling and Scan Sampling methods of behavioral data collection. If an ethogram for a species is not yet available in the existing literature, a student/ researcher can always create their own working ethograms. As already mentioned above, ethograms can be produced for specific categories of behaviour, such as: ethogram of parenting behavior, self-care, foraging, social group behavior in various contexts, such as queuing and waiting rooms, of exploratory behavior etc.

Two ways of describing the behavioral units (postures and activities) that are commonly used when producing the ethograms, as it follows:

1. **Structure-based description**: the description is done accordingly to posture, movements, and/ or the sounds made by an individual.

2. **Consequence-based description:** the description depending on the effects of a behavior on the individual performing it, on another individual, or on the environment. For example, shaking one's hand (structure-based description) can be described as a greeting ritual (consequence-based description).

The ethograms existent in the literature for human behavior and for other species are based on **structural description** of the behavioral units, because they must allow any researcher to quickly identify the described behavioral units. The description must be as accurate as possible. In other words, the description of the behavioral units when producing an ethogram should be limited to the structure of that unit, not to refer to the proximal and ultimate causes of the behavior.

Exercise:

The students are asked to list several examples of behavioral units in regards to their own activity in the last 5 hours by using both methods of description. The examples should be presented to each others (they can work on pairs). A short reflection follows this activity, in terms that students are asked to discuss which of the description are most suitable to produce an ethogram for the period of time of 5 hours, so that everyone should be able to easily understand what the activities and the postures were.

LESSON 3.
EMOTIONS AND FACIAL EXPRESSION OF EMOTIONS IN HUMANS

In this lesson, the students will become familiar with basic research in the study of emotions their behavioral expressions, by stressing the importance of universal emotions in understanding the human non-verbal communication. Students will be presented an overview of tools and methods for assessing behavioral expression of emotions in humans, such as the Facial Action Coding System (FACS).

> ***Note:*** *for this lesson, the students are recommended to read two articles provided in the intranet folder, which were co-authored by Alina S. Rusu. Also, additional resources are indicated throughout the text of the lesson. The two articles recommended for this lesson are:*

1. Andelin, E.I., & Rusu, A.S. (2015a). Identifying non-verbal seductive behavior indicators in the context of initial psychological evaluation in prison – analysis of situational type interviews. *Procedia – Social and Behavioral Sciences*, 209: 61-66.

2. Andelin, E.I., & Rusu, A.S. (2015b). Investigation of facial micro-expressions of emotions in psychopathy – A case study of an individual in detention. *Procedia – Social and Behavioral Science*s, 209:46-52.

Emotions represent some of the most important signals manifested at facial level in various aspects and instances of human life. Regardless of variables such as age, culture, gender and ethnicity, the human face appears to be a complex channel of communication and it is extensively studied (Matsumoto, Frank, & Hwang, 2013). Matsumoto, Frank & Hwang (2013) define emotions as "*bio-psycho-social transient reactions to events that have consequences for our well-being and may require immediate action*."

Ekman & Friesen (2003) define the face as "a multisignal and multimessage system", which offers three types of signals: (1) static (skin color), (2) slow (permanent wrinkles) and (3) rapid (eyebrow lift). In Paul Ekman's studies reflecting over 30 years of scientific investigation of human emotions across cultures, the fundamental question that motivated his interest in facial emotions, micro-expression and body language was: "*Are emotional expressions universal or are they, as any language spoken, specific to each culture*?" (E.g. Ekman, 2003). According to Ekman (2003), facial expressions are universal and that the following seven emotions are universally expressed and recognized at facial level: surprise, fear, anger, sadness, happiness, disgust and contempt.

Emotions are usually approached through different dimensions of analysis, such as: (1) biological, because their manifestation

involve physiological responses from the central and autonomic nervous system, (2) psychological, because they involve specific mental processes, and (3) social, because they are often triggered by social factors and have a social meaning when they are produced, initiated, triggered and perceived.

Ekman & Davidson (1994) bring up for discussion **seven characteristics of emotions**, as they follow: (1) automatic evaluation, (2) communality in past events, (3) the presence of emotions in other species, such as primates (anthropoid monkeys), (4) their rapid triggering (5) short duration, (6) involuntary action, and (7) distinct physiology.

The **Facial Action Coding System** (FACS, Ekman, Friesen & Hager, 2002) is a method frequently used in human ethology and psychology to measure facial non-verbal indicators in social interactions. FACS system was first mentioned in 1970 by Dr. Paul Ekman and his colleagues, while tracking the contraction of each facial muscle (either alone or in combination with other types of muscles), in relation to the emotional states in people. The authors have initially analyzed numerous 5-minutes video recordings of emotional expressions in humans, aiming to identify the changes that take place at level of facial muscles (contractions, relaxations) in relation to specific affective states.

The current version of FACS comprises a total number of 86 facial actions, which are divided by areas that are activated at facial level (Ekman, Friesen & Hager, 2002). Each component of the facial movement that can be observed it is called action unit. A facial

expression (either micro or macro expression) of an emotion can be comprised of more than one AU.

For more details on the history of the development of FACS and on the original idea behind the Action Units, students are recommended to investigate the official platform of Dr. Paul Ekman (https://www.paulekman.com/facial-action-coding-system/), where they can also find information about the categories of macro and micro expressions of the affective states at facial level (Fig. 8).



Fig. 8. Figure illustrating the differences between micro and macro facial expression of emotions in humans.
Source: https://www.paulekman.com/facial-action-coding-system/

The 86 AUs of FACS include the original 28 actions that were described in the primary version, plus 58 Facial Actions that are grouped in several categories, depending on the regions of muscles' activation (Ekman, Friesen & Hager, 2002, Fig. 9):

- AUs in the superior part of the face: AU 1, 2, 4, 5, 6, 7, 43, 45, 46, 70, 71
- head positions: AU 51, 52, 53, 54, 55, 56, 57, 58

- eyes positions: AU 61, 62, 63, 64, 65, 66
- lips partition and jaw opening: AU 25, 26, 27
- AUs in the inferior part of the face: AU 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 28, 72
- combined AUs: AU 8, 19, 21, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39.

For each of the seven universal emotions, several groups of AUs have been identified, such as: Happiness = AU6 + AU12, Sadness = A1 + 4 + 15, Surprise = AU1 + AU2 + AU5B + AU26, Fear = AU1 + AU2 + AU4 + AU5 + AU7 + AU20 + AU26, Anger = AU4 + AU5 + AU7 + AU23, Disgust = AU9 + AU15 + AU16. As it can be observed, some AUs appear in more than one facial expression of emotions, such as AU1 and AU2 (both belong to the upper part of the face), which are present in the expression of fear and in the expression of surprise.

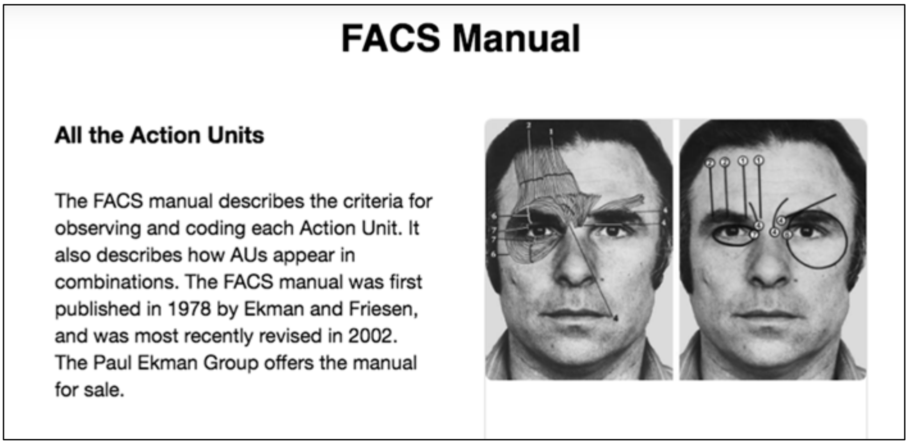


Fig. 9. Print screen from the official website of FACS manual.
Source: https://www.paulekman.com/facial-action-coding-system/

An additional useful and comprehensive resource recommended to the students is the online platform produced by Melinda Ozel *https://melindaozel.com/facs-cheat-sheet-2/*), where they can observe dynamic representations of each of the AUs included in the FACS system.

LESSON 4.
HUMAN AGGRESSION AND AGGRESSIVENESS – THE CASE OF PRISON ENVIRONMENT IN HUMAN SPECIES

This lesson aims to introduce the students in several approaches of human aggression (self- and hetero-aggression) and violence in the context of the existing punishment social systems in humans (prison environment), from the perspective of Tinbergen's questions: how (referring to mechanisms) and why (referring to the adaptive values).

> ***Note:*** *for this lesson, the students are recommended to read one article and one chapter provided in the intranet folder, which were authored by Alina S. Rusu. Also, additional resources are indicated throughout the text of the lesson. The two main materials recommended for this lesson are:*

1. Rusu A.S. (2016). Evolutionary Based Aspects of the Optimal Social Functioning in Prison. *Acta Psychopathologica*, 2:47-31.
2. Rusu, A.S. (2021). Evolutionary Psychology and Incarceration. In "*The SAGE Handbook of Evolutionary Psychology*", Ed. Todd K. Shackelford, vol. 3, pages 243-254.

From psychological and sociological perspectives, aggression is generally defined in the literature as an intentional behavior aimed at inflicting pain and manifested by hostility and attacking behaviors. In animal behavior studies, the aggressive manifestations at behavioral level are included in the category of agonistic behavior, which comprises behavioral elements associated with signaling the attacks, attacks and escalation toward attack, with no stipulations about intentions or goals.

It is generally acknowledged that certain signals (e.g. visual displays, vocal emissions, postures, chemical signals etc.) are strongly associated with escalation toward attack and that they can have similar functions as the physical attacks in intimidating the opponents and winning contests. Such warning signals can be identified not only in animals, but also in humans, especially in those contexts where the direct expression of aggression are imposing heavy costs on the attackers. An example of such context is the prison environment.

From an evolutionary perspective, prison environment represents a complex mixture of selection pressures regarding individuals' decisions at level of interpersonal social networks, by bringing together individuals that are not familiar with each other and who have different social abilities Various correlates of the social functioning in prison have been addressed in the literature, such as: the personality traits of the inmates, psycho-affective vulnerabilities, socio-familial context, behavioral management in detention etc. (e.g. Unver, Yuce, Bayram & Bilgel, 2013; Andelin & Rusu, 2015).

The aspects investigated so far reflect not only the high level of psychosocial heterogeneity of the prison environment, but also the

level of complexity of the process of planning efficient strategies for the prevention of self- and hetero-aggressive behaviors in detention. Up to date, there are no studies concerning the evolutionary significance of the dimensions associated to the optimal dynamic of social interactions in prison environment in terms of **management of human behavior**, specifically their functional values for the survival struggle in this specific environment, in which the most probable resources to be controlled by the inmates are those directly related to their survival, i.e. social interactions that are posing the highest risk to their quality of life.

Some of the **survival abilities** of individuals in detention are *visible* (*conspicuous*), i.e. they can be easily evaluated by other inmates without necessitating long-term interactions, such as: age, gender, voice, physical appearance, body mass, general health, access to social support (family and friends visits). Others survival-related abilities are *less visible* (*hidden*) at a primary evaluation, requiring time and longitudinal social interactions (e.g., ability to recognize emotions in specific contexts, emotional intelligence level, interpersonal dominance or submission tendencies etc.).

Both categories of abilities can be investigated as **predictors for the behavior** of individuals in detention, thus pointing out the need for their inclusion in the professional screening forms of newly convicted persons, especially when dealing with individuals with a known history of aggression.

Aggression seems to be costly in the prison environment not only at an individual level, but also at the level of organization and mobilization of human resources of the penitentiary. Although from

an evolutionary perspective, aggressive behavior is useful for self-defense and resources protection (Buss & Shackelford, 1997), it still remains one of the behaviors posing the highest risk on the quality of life of incarcerated persons, both at physical and a psychological levels, being often associated with self-harm and suicide in victims of aggressions (Towl, 2003; Campbell, 2005).

Violence is considered a major problem in human societies, including the prison environment, and it is frequently associated in the literature with deficits in the **facial emotion decoding accuracy** (Hoaken, Alllaby, & Earle, 2007). Emotion identification errors, especially anger, are significantly associated with **attribution of instrumental value to aggression** in social contexts. Thus, a high level of aggressive attitudes and verbal aggression can be often associated with misperception of anger even in its absence (Dodge, 1993). Also, individuals with a propensity for violence (which are frequently met in prison environment) have a higher probability of inadequately interpret subtle social cues, such as facial micro expressions of emotions (Hoaken, Allaby & Earle, 2007).

According to the **social information-processing model** (McNiel, Eisner, & Binder, 2003), errors in emotion decoding accuracy could affect individuals' ability (especially of those predisposed to violent behaviors) to access and employ alternative adaptive responses to social situations, which in turn can favor the process of accessing primary phylogenetic strategies, such as violence. In the case of incarcerated persons there are data indicating that the ability to recognize facial expressions of fear and anger is reduced in

inmates with a higher number of arrests and with a history of aggression (Dodge et al., 2003).

From an evolutionary perspective, the ability to optimally detect facial expressions of emotions, in particular those associated with anger, is hypothesized to have enhanced the chances of survival and reproduction of our ancestors in the environment of evolutionary adaptedness, anger being the main indicator of the intention to aggress another individual (Hoaken, Allaby & Earle, 2007). Data referring to the preparedness of humans to quickly detect vocal and facial expressions associated with anger indicate the fact that natural selection has molded this ability in association to responses to survival-related situations (Grandjean et al., 2005).

Another important factor for optimal social functioning in prison in terms of regulation of human behavior (e.g. control of impulsive tendency to react behaviorally) appears to be the level of **emotional intelligence** (EI). EI seems to be a relevant factor for accessing strategies of responding to social situations other than the primary answers such as quick and violent behaviors. Having access to emotional signals and decoding them correctly increases the chances of correctly evaluating the attitudes and intentions of others (e.g. Mayer, Roberts, & Barsade, 2008), of determining if social conflict is imminent and of adjusting interactive behavior in accordance with the perceived emotions.

The **social-cognitive theory of power** (Fiske, 1993) posits that the ability to perceive others, which is an important component of EI, plays an important role in the social functioning outcomes. According to this theory, individuals situated in positions of power tend to perceive

the others in a non-individualizing, stereotypical manner. On the other hand, less powerful individuals (i.e., submissive individuals) seem to be favored by individualizations of others because they consider interpersonal relationships as depending on the more powerful individuals and on the interaction partners in general (Fiske, 1993).

Consistent with the aspects presented above, it is recommended that, besides the standard psychological screening forms that are generally used in prisons, the usage of ethological methods in observing behavior, as well as the assessments of Emotional Intelligence, and the emotion decoding accuracy should be taken into consideration as bio-psychological and evolutionary predictors of optimal social functioning in the prison environment.

Exercise:

At the end of this lesson, the students will be presented a short documentary on the program of emotional and behavioral rehabilitation of inmates in the Northern US "Step inside the circle": https://www.youtube.com/watch?v=FVxjuTkWQiE

The students will be guided to critical reflect on the behavior of the inmates in the video material. Also, they will reflect on the mechanism of change that they consider it is behind the positive effects of this type of programs that bring together heterogenous populations of people with aggression and violence related problems.

LESSON 5.
COMMUNICATION SYSTEMS IN HUMANS – THE CASE OF HUMAN MATING BEHAVIOR

In this lesson, the students will become familiar with evolutionary approach of the cost-benefit analysis in different types of communication processes in humans, including the paradox of communication and information masking strategies (protean strategy) in the context of seductive behavior in humans. They are expected to understand how methods of human behavioral data collection can help in understanding the evolutionary significance of various aspects of human mating behavior.

> ***Note:*** *for this lesson, the students are recommended to read two articles that were authored and co-authored by Alina S. Rusu. Also, additional resources are indicated throughout the text of the lesson. The two articles recommended for this lesson are the following:*

1. Rusu, A.S., & Bencic, A. (2007). Choosing a mate in Romania: A cognitive evolutionary psychological investigation of personal advertisements market. *Journal of Cognitive and Behavioral Psychotherapies*, 7:27-43.

2. Andelin, I.E., & Rusu, A.S. (2016). An evolutionary analysis of seductive behavior of newly convicted females during primary psychological interview: Does suicidal attempt matter? *The European Proceedings of Social & Behavioral Sciences*, eISSN 2357-1330, 18:27-34.

Human mating behavior, particularly human mate choice, has been widely studied by evolutionary psychologists and psychologists. However, there is no common agreement among researchers regarding the fundamental mating strategies of humans (Schmitt, 2005). Sexual reproduction is generally known as the process by which two individuals donate genetic material for the creation of their descendants that differ genetically from both parents. The inter-individual variation resulting from sexual reproduction is considered to be the basic material for evolution via natural selection, as certain individuals are able to adapt better to their socio-ecological environment than others. Such a variation in adaptability is translated into variation in individual fitness (i.e., individual reproductive success and offspring abilities to survive and reproduce, Hamilton, 1964).

Given that offspring are the primary vectors of parental fitness, the strongest interests of the parent's fitness should be to produce offspring that would well adapt to the prevailing environmental conditions. In this light, individuals it is expected that should carefully chose their mates in order to fulfill the above mentioned fitness interests. Indeed, individuals of all sexually reproducing species, including humans, select mates that advertise their fitness qualities

either directly, by possessing certain morphological, behavioral and psychological traits, or indirectly via the possession of superior resources (i.e., space, food, money etc.).

In nearly every human culture, the long-term bonds (that are usually formalized as marriages) develop as a result of mate-choice decisions made either by the male and the female partners or by their relatives thereof (Buston & Emlen, 2003). Assuming that there is variation in terms of reproductive success between different marriages, then natural selection should favor those decision rules that govern the formation of the most reproductively successful couples (Buston & Emlen, 2003). In humans, the most common hypotheses of mating strategies are:

- **the monogamy hypothesis,** which states that human species is designed for long-life monogamy (Hazan & Zeifman, 1999);
- **the polygynous relationship hypothesis**, which posits that men are designed to mate with more than one partner at a time, the pluralistic mating repertoire hypothesis (Belsky, Steinberg, & Draper, 1991);
- hypothesis that, in humans, the two sexes have invented **specific strategies** of their own (Buss & Schmitt, 1993). As a way to reconcile all the evolutionary debates on human mating phenomena, it is now generally acknowledged that humans have adapted for more than one mating strategy (Schmitt, 2005).

The theory that appears to found all the hypotheses listed above is the **parental investment theory** (Trivers, 1972), which states

that the relative proportion of investment in rearing the offspring varies across males and females. The asymmetry regarding the parental investment of each sex is supported by the facts that a female needs fewer matings to fertilize the eggs she can produce during the entire life, whereas a male has the potential to fertilize a much higher number of eggs than one female can produce. Trivers (1972) argues, because of this difference, the reproductive success of females tends to be limited by their access to resources needed for the nourishment of each of their eggs, while the reproductive success of males tends to be limited by their access to females. Given these **conflicts of interests between the two sexes**, it is expected that the mate-search strategies differ between males and females accordingly.

Typically, across human cultures, men invest less in their offspring than women. As in the cases of females of other species that reproduce sexually, women have to support the costs of internal fertilization, placentation, gestation, lactation and obligatory parenting at least until weaning time, which is usually around the fourth year after giving birth to a child (e.g. Schmitt, 2005). In humans, as in other species, this asymmetry in parental investment should result in sex-specific differences at level of “choosiness” in mate preferences.

There are studies indicating that women, as opposed to men, express a stronger preference for attributes referring to resources necessary for the survival and success of offspring developing from their fertilized eggs. Previous investigations indicate that some of the resource-related attributes that women generally seek are: financial wealth, social status, desire for children and desire for commitment

(Bereczkei et al., 1997). Since all these attributes are age-dependent traits in men (i.e., older men in average have greater access to resources critical to female reproduction), women usually tend to seek older partners.

Like the males of other sexually reproducing species, men commonly select their mating partners on the basis of cues that correlate with female fecundity, such as youthfulness, health, and physical attractiveness (e.g. Pawlowski & Dunbar, 1999). As pointed by Trivers (1972), male gametes are relatively much cheaper than female gametes, so male fitness interests would be best fulfilled when mating with females that could best propagate the genes of their mates to the next generations.

The way each sex expresses **choosiness** in the process of mating varies widely across animal taxa and across human cultures (Schmitt, 2005). Overall, evolutionary psychologists consider mate choice a negotiation process between the two partners. In animals, because of the problems in ascertaining exactly what an individual was looking for when choosing its partner, it is relatively difficult to evaluate the trade-offs made by individuals during this process (Pawlowski & Dunbar, 1999). However, the problems of assessing what an individual exactly sought during the process of mate-choice diminish in humans. Indeed, humans sometimes engage in forms of mate search in which they explicitly state what they have to offer to their partner and, as well, what they expect from them. One of the most common form in which such an accurate communication occurs between individuals is the **market of personal advertisements** either online or via newspapers.

Personal advertisements are considered human products and sources of behavioral data in human ethology. A personal advertisement in the context of mate-choice usually consists of a list of self-descriptive attributes (i.e., words describing the traits of the advertisers) and a list of attributes of the traits the advertisers seek in a prospective partner (Pawlowski & Dunbar, 1999). Previous studies of personal advertisements in various countries indicate a high correlation between mate choice patterns reflected by advertisement market and patterns emerging when investigating the mate preferences by using questionnaires. Moreover, the evolutionary study of personal advertisements can reveal differences between studied populations, and that might indicate adaptations to specific spatial-temporal features of culture, ecology and economy.

Exercise:

At the end of this lesson, the students are required to create a short personal advertisement using attributes to describe themselves and to describe the sought partner. They will be given five minutes for this task. The advertisements will be then analysed together with the teacher, by using the method of qualitative content analysis. The resulting codes and categories will be further interpreted from their ethological and evolutionary psychological significance.

LESSON 6.
ETHOLOGICAL PARTICULARITIES OF THE HUMAN NEEDS AND THE INTERPRETATION OF HUMAN PRODUCTS AS SOURCES OF BEHAVIORAL DATA

In this lesson, the students will become aware of theories and models of interpreting the human needs from an interdisciplinary perspective and how they can extract and interpret significant behavioral data from Human Products (HPs). Theories such as niche construction theory, life history, extended phenotype and the Darwinian approach to aesthetic preferences in humans will be discussed.

Note: *for this lesson, the students are recommended to read an article and one chapter, as listed below. Also, additional resources are indicated throughout the text of the lesson. The two publications recommended for this lesson are the following:*

1. Kenrick, D. T., Griskevicius, V., Neuberg, S. L., & Schaller, M. (2010). Renovating the Pyramid of Needs: Contemporary Extensions Built Upon Ancient Foundations. *Perspectives on*

psychological science: a journal of the Association for Psychological Science, *5*(3), 292–314.

2. Rusu, A.S. (2017). Chapter "Human Products" in Encyclopedia of Evolutionary Psychological Sciences. Eds. T.K. Shackelford, V.A. Weeked-Shackelford. Springer.

The Maslow's Pyramid of independent sets of human needs (Maslow, 1943), i.e. immediate physiological needs, safety, affection, esteem and self-actualization, offers generous possibilities of interpretations of several aspects of human developmental and social functioning, including the human motivation to produce items, methods, information corresponding to their needs (Fig. 10).

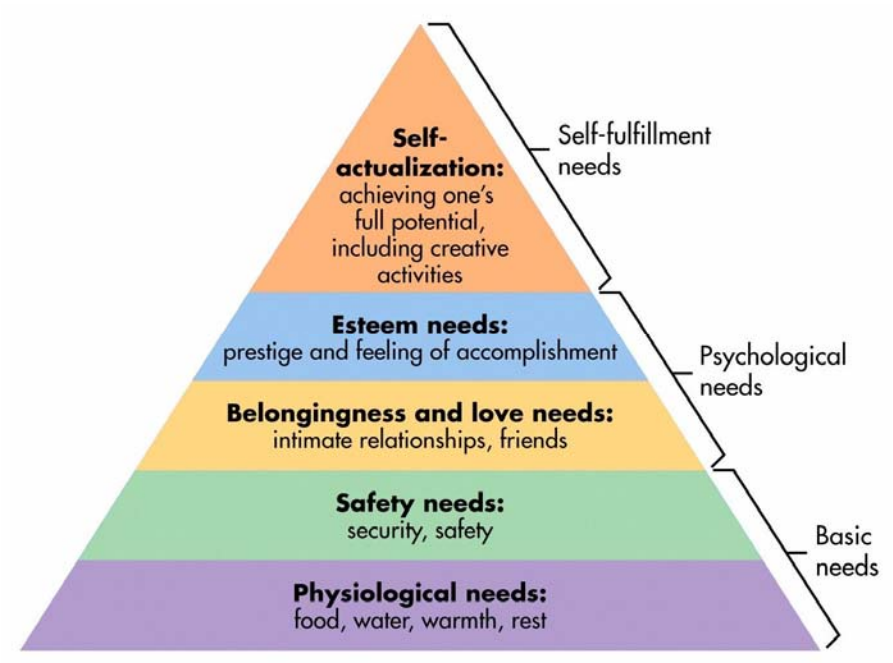


Fig. 10. The classic model of Maslow's Pyramid of human needs. Source: https://www.simplypsychology.org/maslow.html.

Having in mind the classic figure of the Maslow's Pyramid, the students will be introduced to an updated version of Maslow's Pyramid of needs, which was developed by Kenrick et al. (2010) in the light of theoretical development at the interface of evolutionary biology, psychology and anthropology. The **renovated Pyramid of Needs** (Fig. 11) highlights the connections between fundamental motives and immediate situational threats and opportunities in human existence, hence anchoring the hierarchy of human motives in the field of modern evolutionary theory. The updated Pyramid examines human motives at three levels of analysis:

1) Their ultimate evolutionary function;
2) Their developmental sequencing
3) Their cognitive priority as triggered by proximate inputs.

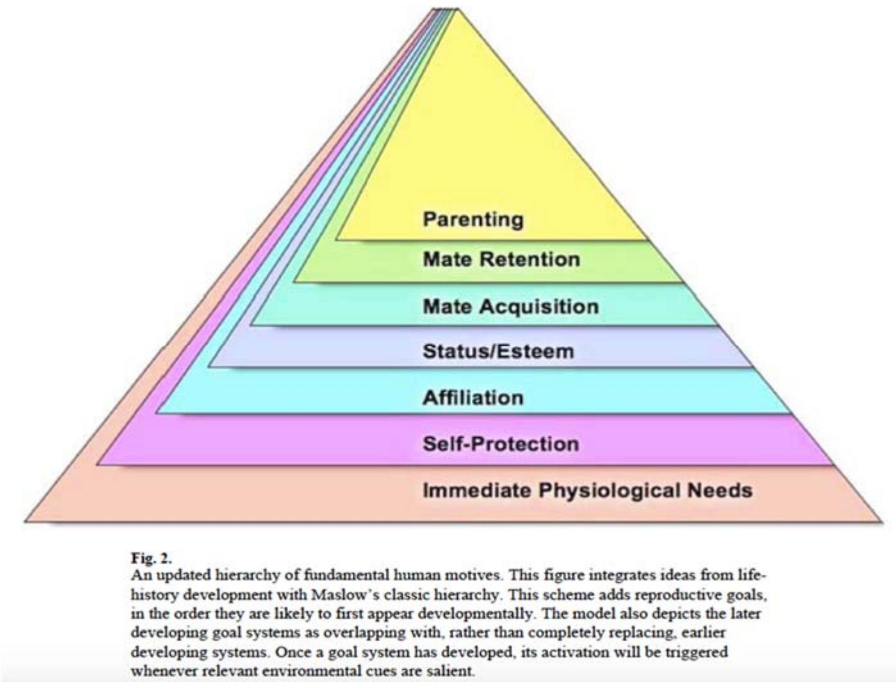


Fig. 11. The updated Pyramid of human needs. Source: Kenrick et al. (2010)

The most important aspect of the updated Pyramid of Needs is the functional reconsideration of the self-actualization, which is not regarded anymore as a functionally distinct human need. Based on their new interdisciplinary framework of analysis, Kenrick et al. (2010) have removed self-actualization from the top of the pyramid and subsumed it within status (esteem) and mating-related motives.

In the process of Pyramid's updating, the authors have combined the development level of analysis with the biological framework of **life history theory**, which addresses the trade-offs between the organisms and their environment, in terms of how the time and energy should be allocated in activities and traits that have the potential to maximize their fitness.

The updated Pyramid includes the following fundamental human motives, starting from the base:

- Immediate Physiological Needs;
- Self-Protection;
- Affiliation;
- Status/Esteem;
- Mate Acquisition;
- Mate Retention;
- Parenting.

One can notice that the top of the Pyramid contains three reproductive goals, appearing in their developmental order. The authors stress the fact that the later developing goal systems are overlapping, rather than replacing earlier developing systems and,

once a goal system has developed, its activation can be triggered by salient relevant cues (Kenrick et al., 2010).

Several human products are parts of **tactics of benefit-provisioning behaviors**, which "*…are mate retention behaviors that are intended to increase the incentives of staying mated to the current partner and, in turn, deter defection from the relationship. These behaviors can include things such as buying gifts for the partner, altering one's appearance, and different sexual behaviors*" (Holden et al., 2014).

If we consider **a case analysis of a human product**, for example, a wedding ring, from an evolutionary perspective, the product might indicate a resource display within the positive inducement tactic, such as the ability of a partner to provide resources to the female and her offspring and/or intentions of emotional investment – love and affection – in the relation. Also, wedding rings may offer indications about another tactic within the benefit provisioning process, which is **the possessive ornamentation**, meaning that a male might offer a wedding ring (or another symbolic product) to his female partner to convey to same-sex individuals the status of the relationship (Holden et al., 2014). While a wedding ring can generally be associated with **relationship status** in nearly any type of human cultures, other forms of human products might be either more ambiguous regarding the information they convey or they tend to be presented with specific explanations to the persons expressing interest in the history of the product (e.g., the story of a scarf received as a gift from a former romantic partner in a specific moment of life).

If the example of the wedding ring is taken through the multi-level analysis framework provided by the updated Pyramid of Human Needs model (Kenrick et al., 2010), one can notice that such an item may offer data on two **reproductive human motives** (mate acquisition and mate retention), but also on the **status/esteem motive**.

The acquisition of reproductive-related human products, such as wedding rings or a wedding dress, may offer data on the **developmental stage** in which an individual is. Hence, a man who purchases a wedding ring is rather on a sexual maturity stage than on an early stage of his ontogenetic development. The value of the wedding ring might offer data not only on the status/esteem of the person, but it may also indicate that a person who can afford to offer an expensive ring to a potential partner has most probably no difficulties in terms of the fulfillment of the individual needs situated at the base of the Pyramid (i.e., immediate physiological needs: access to food, water and shelter).

In terms of sources of data, human products can be analyzed from the perspective of several inclusive fitness-related functions (i.e. inclusive fitness is referred here as the abilities of an individual to further pass its genes on to the next generations; Hamilton, 1964). These functions can be either centered on the individual physiological needs (e.g., clothing for the regulation of body temperature, food preparation, access to water etc.) or on intraspecific interactions (couple, family, cultural groups and other types of institutions), interspecific interactions (e.g., human-animal interactions) and interactions with the physical environment in the direction of

optimizing and controlling the environment according to the level of life-allowing tolerance.

- **HPs as indicators of niche-construction process**

The idea of individuals changing the environment according to their contextual, developmental and evolutionary needs is comprised in the **niche-construction perspective** (Laland & Brown, 2006). The interaction with the environment is nowadays considered as being bidirectional, in terms that organisms adapt to their environment and they adapt the environment to their needs. Like other animal species that are manufacturing nests, holes, webs, burrows etc., humans can change/adjust/construct their physical and social environment. Laland and Brown (2006) point out that the niche construction implies not only building environmental components, "*but regulate to damp out variability in environmental conditions*". Hence, human products may convey data on the environmental variability the humans are faced to and the solutions they came up to minimize this variability. The authors argue that niche construction is not an end product of evolution, but a continuous cause of evolutionary change (Laland & Brown, 2006).

The large variety and the intensive dynamic of HPs (including virtual information) indicates that, compared to other animal species, humans appear to be effective niche constructors that are continuously challenged by the interaction between their cumulative culture and their evolutionary and developmental needs, as well by the contextual threats and opportunities (see Laland & Brown, 2006). Culture is seen

here as "*the ability to acquire and transmit learned knowledge, beliefs and skills and to devise ever more efficient solutions to problems that build on this reservoir of shared knowledge*" (Laland & Brown, 2006).

While some human products can be interpreted as parts of the extended phenotype of individuals, based on the effects that the candidate genes for that type of product has on the environment (Dawkins, 1982), there are theoretical studies (mathematical population genetics) indicating that the niche construction does not have to be based on genes in order to impact the evolutionary process. Hence, it is believed that human culture and the process of niche construction have become self-reinforcing, and that the trans-generational culture changes the environment in a manner that favors more culture in order for the human beings to fulfill their needs.

Much of the HPs (elements of the constructed environment), specifically the ones that are related to the human motives situated at the base of the updated Pyramid of Human Needs (Kenrick et al., 2010), appear to be resistant to trans-generational culture, in terms that their basic characteristics indicate their original utilitarian function and that they are generally shaped to suit the human bodies (e.g., cups, forks, knives, clothing, socks, beds, chairs, doors etc.). Typically, niche construction in humans can have immediate fitness benefits to the constructor or to those who acquire the products (Laland & Brown, 2006). However, some human products (e.g., medical products, nuclear power plants etc.) may have critical consequences for the environment, which can be translated into negative effects on human fitness. Hence, the presence of these types of products in a specific

environment may offer data on the negative effects the products can bring to human individuals and other living species, but also on their potential as selective pressures.

Some HPs can be transformed by the users according to their specific needs or body characteristics, e.g. a wheel chair can be adapted to the human body shape and posture, clothing can be adjusted to the length of the legs etc. Other products, even though they do not fit the personal preferences of the users in terms of aesthetic appearance and proximate needs, can not be reshaped/adapted due to their built-in characteristics or because there represent unique art-work pieces.

The huge diversity of traits within the same utilitarian category of human products (variations in shape, color, size etc.) has attracted a lot of interest toward the analysis of the **aesthetic qualities** of human products in relation to the evolved aesthetic preferences of humans. Such preferences are thought to be based on the aesthetic experiences of individuals while interacting to their environment (in a direction of favoring the inclusive fitness of individuals) and are supposed to be molded by natural selection through the adaptive advantages conferred by emotional responses during the process of problem solving and decision making in relation to elements of habitat (Hogh-Olesen, Tonnesvang & Bertelesen, 2009).

Besides the habitat selection-based explanation of human aesthetic preferences, Miller (2001) has introduced an updated idea of the connection between human appreciation of beauty and mate-choice (Darwin, 1874), arguing that many design features of art

products may function as indicators of "*artist's virtuosity, creativity, intelligence, conscientiousness and other important heritable mental and physical traits*" (Hogh-Olesen, Tonnesvang & Bertelesen, 2009).

In other words, Miller (2001) suggests that the aesthetic judgment can be part of the mate-choice process and social cognition, in terms that art-work can be seen as an extended phenotype of the artist (Hogh-Olesen, Tonnesvang & Bertelesen, 2009). Also, the large variation within the same category of products allows the individual aesthetic preferences to manifest at level of decision of purchasing of one variation over others.

Much of the HPs are nowadays a result of mass production (e.g., cups, glasses, makeup, clothing products etc.) and their authors are individually unknown to the persons that are purchasing the products. Hence, the decision to purchase a product may offer data on the needs of the user, his/her aesthetic preferences and on the qualities of the product that match the search image of the user. In some cases, such as art exhibitions and fashion shows, the authors of the products reveal themselves to the potential buyers. In these cases, i.e. having some information about the persons behind the products, the users/buyers tend to pay more attention to the association between the psycho-social characteristics of the producers and the products, in terms that the decision to purchase the product may be based on this association. Therefore, the labels of several successful human products (in terms of high demand on the market) may offer data not only on the quality of the product itself, but also on the socially and economically perceived image of the producer. Also, a highly

expensive and rare brand can offer data on the socio-economic status of the purchaser, thus functioning as a badge of status for the owner of the product.

One can infer that, besides their primary utility, human products may offer data on the personality-based and cultural-shaped aesthetic preferences of their users/owners and that the products a person is acquiring during specific moments of lifetime may be considered as elements of that person's **extended phenotype**. Besides the data on the aesthetic preferences of the user and on the human motives illustrated by the updated Pyramid of Human Needs (Kenrick et al, 2010), HPs may also provide data on the personal significance of a product.

Exercise:

Students are being asked to bring with them or show to the cameras (in case the lecture is being delivered in an online format) a small personal item. After presenting the item, they are asked to allocate 2 minutes to describe its features and the personal meaning.

Studies on symbolic meaning of human products in relation to **Positive Design** (Positive Design is possibility-driven design that enables positive experiences in the direction of improving human well-being; Desmet & Pohlmeyer, 2013) indicate that people from different cultures tend to attribute symbolic meanings to a large variety of products in association with their need for subjective happiness and personal comfort.

HPs with symbolic meaning can provide the users with the following additional functions (besides the primarily utilitarian function), most of them indicating individual context-sensitivity (Cassais, Mugge, & Desment, 2016): preserve memories, remind of goals of aspirations and help build and signal identity. The products that are mostly accessible through specific stages of development (e.g., favorite toys during childhood) can be offered symbolic meaning in associations to those stages. These associations between products and specific stages of development may be recalled later in life.

While the process of decoding the personal symbolic meaning of a human product requires access to data based on self-reports (e.g. interview, content analysis of a diary etc.), some products can offer direct cultural specific information (e.g. flags, badges etc.). **Physical characteristics** of HPs, such as their solid structure for example, facilitate their preservation through long periods of time (e.g., cups, printed pictures, miniatures, carpets etc.), which is in the favor of construction of symbolic meaning.

The symbolic meaning of a product is constructed by the owner of that specific product (in the direction pointed by the extended phenotype theory), meaning that, without the communication of the meaning by the owner, the symbolic meaning may never be revealed to other persons. Some products, such as the personal advertisements, are produced and used for specific periods of time and their content offers clear indications on what individual need from a potential partner.

- **Human products (weapons) as indicators of intraspecific aggression**

Buss & Shackelford (1997) start their paper on the evolutionary perspective of human aggression with a reference on the usage of weapons by our ancestors, as indicated by ancient hominid skeletal remains (Trinkaus & Zimmerman, 1982). In the explanatory evolutionary psychological frame of human aggression, weapons, as human products, besides their hunting utility, can functionally fit within all the seven **intraspecific adaptive problems** proposed by Buss & Shackelford (1997) for which aggression might have evolved as a solution:

(1) co-opting the resources of others
(2) defending against attack
(3) inflicting costs on same-sex rivals
(4) (negotiating status and power hierarchies
(5) deterring rivals from future aggression
(6) deterring mates from sexual infidelity
(7) reducing resources expended on genetically unrelated children.

Within these aggression-related strategies, the individual decision to use a weapon and the need to purchase such a human product is context-sensitive. Besides the evolutionary psychological explanations listed above (which can be associated with the presence of weapons in human existence), like other types of HPs, weapons may offer data on: the degree of mastery a person needs to acquire in

order to properly use the product, the aesthetic preference of the user, the possibility to be used by a sole person or if it requires cooperative work, the degree of innovation of the producer etc.

LESSON 7.
THE CONCEPT OF FITNESS APPLIED TO THE UNDERSTANDING OF HUMAN SOCIAL BEHAVIOR – THE CASE OF HELPING BEHAVIOR

In this lesson, the students will be guided through elements of prosocial behavioral manifestations and behavioral systems in humans and several explanatory frames and models of the helping and altruistic behavior. Students will be introduced in the psycho-physiological explanations of these typed of behaviors, such as the potential roles played by several neurotransmitters and hormones.

> ***Note:*** *for this lesson, students are recommended to read and critically analyze the chapter authored by Alina S. Rusu, which will be offered to them in a pdf format, strictly for the internal usage (no external distribution of this chapter in press in allowed).*

- Rusu, A.S. (*in press*). Endorphins and volunteering: On the Evolutionary Significance of Helping Others. In "*Endorphins: From Molecular Science to Modern Medicine*", Eds. Patrick Kerr, Cristian Sirbu & John Gregg, Springer Nature.

Life in bonded social groups of humans is known to be associated with a diversity of inclusive fitness-related benefits, such as

longevity and subjective well-being, as well as costs, such as the stress associated with the increased size of social networks of unrelated individuals with whom a person can interact (Launay et al., 2016). Inclusive fitness is commonly defined as the ability of an individual to further pass her/his genes on to the next generations; Hamilton, 1964).

In primates, social bonding is primarily supported by specific forms of social behavior, such as grooming (Dunbar & Lehmann, 2013), which is known to be mechanistically underpinned by the release of endogenous opioids within the reward neural circuit (Martel, Nevison, Simpson, & Keverne, 1995).

The **costs of helping others** (e.g., through caregiving, involvement in volunteering, through specific professions) include psychological and physiological correlates of caregiver distress. Most of the studies addressing this phenomenon fail to distinguish between the stress associated with helping behavior *per se* and the feelings (e.g., compassion, sadness, helplessness) about the recipient (Brown & Brown, 2015). However, recent evidence from large-scale studies suggests that informal caregivers, as well as volunteers, experience positive states associated with helping others and other increased aspects in health and psychological well-being (Jenkinson et al., 2013).

Most of the studies documenting the neurobiological substrate of successful social interactions, such as offering and receiving help from others in situations of need, point toward the **rewarding value** of these types of interactions for humans (E.g. Krach, Paulus, Bodden, &

Kircher, 2010). For example, **dopamine (DOPA)** is one of the most commonly suggested candidates for the potential explanation of the phenomenon often referred as "*volunteer's high*" or "*helper's high*" (Luks, 1988), commonly described as a sensation of pleasure and subjective happiness associated with the participation in volunteering and charity activities.

The connection between **Endogenous Opioid System** (EOS, an innate pain-relieving system) activity and social bonding activities is strongly supported in non-human primates. For example, in talapoin monkeys, the administration of an endorphin receptor antagonist in males was associated with increased rates of dyadic grooming (Fabre-Nys, Meller, & Keverne, 1982). Also, in the same species, direct measurement of beta-endorphins in the central nervous system indicated that there were higher levels of this molecule following social grooming (Fabre-Nys et al., 1982). There is a large body of literature supporting grooming's function as a reinforcing behavior for social cohesion and peaceful relations in primate groups.

A recent evolutionary perspective has emerged regarding the possibility that EOS might have been co-opted in the evolutionary history of primates to support the human need for the enhanced social bond (Launay et al., 2016). Based on this perspective, one could interpret the functions of prosocial behavior like volunteering as **"grooming-like behaviors"** (or to "groom at a distance"; Dunbar, 2012), without direct physical contact with the recipient(s). Thus, from an evolutionary perspective, volunteering may promote social connectedness among large communities in the same ways as

grooming. Moreover, the existence of coordinated programs of volunteering means that this type of grooming-like behavior can be simultaneously directed to multiple members of the same community (e.g., activities in which health services, food and/or sanitary packages are simultaneously offered in a coordinated manner to a whole community by volunteers belonging to the same organization).

In their attempt to provide an integrative explanation of research on the connections between helping others and health benefits for the helper, Brown and Brown (2015) propose a **neurobiological model of prosocial (helping) behavior** aiming to identify the neuronal substrates (events and circuitry) behind the health-related benefits of helping behavior and of the adaptive significance of motivation to help. The model is referred to as a **caregiving model**, which, at its primary evolutionary significance, like the parental caregiving system, functions on a fitness-improvement logic (i.e., in the direction of achieving a safe social environment for the preservation of community).

Based on the well documented prosocial behavioral parallels between humans and other mammalian species (Preston, 2013), the bedrock of Brown and Brown's (2015) caregiving model is the **neuroscience of mammalian parenting** (Numan, 2006). This offers a useful tool for understanding the potential neural map of prosocial motivation in humans. Thus, Brown and Brown (2015) describe a set of neurocontingencies that might have their evolutionary roots in providing offspring care, which, through genetic and cultural evolution, might have offered a "*...regulatory infrastructure to*

support a more flexible and generalized system behavior, not restricted to biological kin and not readily exploited by cheaters" (Brown & Brown, 2015).

Brown and Brown (2015) propose three evolutionarily-based explanations for the redirection of parent-like helping behaviors to unrelated individuals:

- **indirect reciprocity** (e.g. Nowak, 2006) – i.e. a beneficial act whose return comes from individual(s) other than the act's recipient (Tullberg, 2004);
- **the fitness interdependences** – i.e. the bidirectional correlation of the helper's reproductive success with that of the recipient (Brown & Brown, 2006; Roberts, 2005);
- the idea of considering helping unrelated others as an **evolutionary "misfire"**, meaning that the helping response, which is assumed to be evolutionarily shaped to help individuals in need who are either kin or reciprocators (direct and indirect ones), could be activated in the current social environment by others in need, regardless of relatedness and of helping reciprocity (Dawkins, 1989).

Regarding the **health effects of helping others** in need, Brown and Brown (2015) hypothesize that **prosocial motivation** (caregiving motivation) is part of a chain of interconnected biochemical events that function in the direction of stress and inflammation reduction. According to the neurobiological caregiving model, **oxytocin**, which reduces stress and inflammation through interaction with other

hormones that regulate immunological functioning, modulates the neural circuitry behind caregiving (active help) motivation and behavior.

Exercise:

At the end of this lesson, students are guided to reflect for 3 minute about an act of helping others in which they were involved as givers in the last month. They will present the case in front of the group and, together, the students will identify the attributes indicated their affective states associated with the act of helping behaviors. They will also discuss what types of emotional behaviors did they perceive in the receivers of their helping actions.

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